

1. An anti-siphon shunt device for regulating fluid flow in a patient, comprising:
a housing defined by a chamber for fluid flow therethrough, an inlet port for passage of fluid into the chamber, and an outlet port for release of fluid from the chamber;

a valve mechanism disposed within the housing for regulating fluid flow through the chamber over a pressure gradient, the valve mechanism including a barrier mounted within the chamber having an opening thereon for fluid flow therethrough;

a pressure sensor for detecting an external pressure surrounding the chamber; and

a biasing element in communication with the pressure sensor and exerting a biasing force against a first surface of a blocking element, the blocking element being configured to seat against the opening to prevent fluid flow therethrough;

wherein a countervailing pressure acts upon a second surface of the blocking element in a direction opposite to the biasing force, the area of the first surface exposed to the biasing force being substantially equal to the area of the second surface exposed to the countervailing pressure.

2. The device of claim 1, wherein the blocking element comprises a spherical ball.

3. The device of claim 1, wherein the opening includes a valve seat having a contoured surface for mating with the second surface of the blocking element.

4. The device of claim 1, wherein the pressure sensor comprises a vent port on the chamber, the vent port including a conformable membrane susceptible to a reference pressure external to the chamber.

5. The device of claim 4, wherein the reference pressure is atmospheric pressure.

6. The device of claim 4, wherein the conformable membrane is attached to the biasing element.
7. The device of claim 4 wherein the pressure sensor further comprises a reference pressure chamber enclosing the conformable membrane.
8. The device of claim 7, wherein the reference pressure chamber is in communication with an air tube, the air tube being connected at one end to the reference pressure chamber and at another end to a pressure gauge.
9. The device of claim 8, wherein the pressure gauge comprises a flexible membrane susceptible to the external pressure.
10. The device of claim 9, wherein the external pressure is within the patient's peritoneal cavity.
11. The device of claim 1, wherein the biasing element comprises flexible bellows.
12. The device of claim 1, wherein the biasing element is a programmable spring mechanism.
13. The device of claim 1, wherein the biasing element is a spring mechanism having a fixed biasing force.
14. The device of claim 1, wherein the biasing element is selected from the group consisting of a leaf spring, coiled spring, and helical spring.

15. The device of claim 1, wherein the displacement of the blocking element is proportional to the displacement of the biasing element.
16. The device of claim 1, further being configured for implantation in the patient.
17. A shunt device for regulating fluid flow in a patient, comprising:
 - a housing having a chamber for fluid flow therethrough, an inlet port for passage of fluid into the chamber, and an outlet port for release of fluid from the chamber;
 - a valve mechanism disposed within the housing for regulating fluid flow through the chamber over a pressure gradient; and
 - a pressure sensor in communication with the valve mechanism for detecting the external pressure surrounding the chamber, the pressure sensor comprising a vent port on the housing, the vent port having a conformable membrane surrounded by a reference pressure chamber.
18. The device of claim 17, wherein the reference pressure chamber is in communication with an air tube, the tube being connected at one end to the reference pressure chamber and at another end to a pressure gauge.
19. The device of claim 18, wherein the pressure gauge comprises a flexible membrane susceptible to the external pressure.
20. The device of claim 18, wherein the flexible membrane is comprised of a gas-impermeable polymer.
21. The device of claim 20, wherein the impermeable polymer consists of a laminate of more than one polymer.

22. The device of claim 20, wherein the flexible membrane includes metallized internal surfaces for rendering the membrane impermeable to gases.

23. The device of claim 19, wherein the external pressure is a pressure within the patient's peritoneal cavity.

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